

Serial No. 10/026,811
March 15, 2004
Reply to the Office Action dated December 19, 2003
Page 4 of 7

REMARKS/ARGUMENTS

Claims 16-19 are pending in this application. By this amendment, Applicant amends claims 16 and 18.

Claim 16-19 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Applicant has amended claim 16 to correct the informality noted by the Examiner. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 16-19 under 35 U.S.C. § 112, second paragraph.

Claims 16, 18 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Kushida et al. (U.S. 4,692,653). And claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kushida et al., and further in view of Tsuji et al. (U.S. 5,699,027). Applicant respectfully traverses these rejections.

Claim 1 has been amended to recite:

"A method of manufacturing an electronic element, comprising the steps of:

 providing a piezoelectric substrate;
 forming electrode pads on the piezoelectric substrate;
 disposing base electrodes on the electrode pads;
 disposing intermediate electrodes on the base electrodes, such that the base electrodes are located between said electrode pads and said intermediate electrodes;
 forming bump electrodes on the intermediate electrodes;
 disposing the electronic element on a package having package electrodes such that said bump electrodes oppose said package electrodes; and
 press-bonding said package electrodes to said bump electrodes while applying ultrasonic waves or heat;
 wherein said intermediate electrodes are made of at least one of Al and an alloy including Al; and
 said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to greater than about 15 degrees." (Emphasis added)

Serial No. 10/026,811
March 15, 2004
Reply to the Office Action dated December 19, 2003
Page 5 of 7

The Examiner acknowledged that AAPA fails to teach or suggest base electrodes including a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in the intermediate electrode greater than about 15 degrees. However, the Examiner alleged that col. 1, lines 26-54 of Kushida et al. teaches "the metallic material disposed on top of an electrode must have high crystallinity and c-axis orientation." Thus the Examiner concluded that it would have been obvious to modify Applicant's Admitted Prior Art such that the base electrodes are made of a material that has the high crystallinity and c-axis orientation which allegedly "increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in the intermediate electrodes greater than about 15 degrees" as taught by Kushida et al. for creating the high electro-mechanical coupling factor." Applicant respectfully disagrees.

The Examiner alleged that col. 1 lines 24-56 of Kushida et al. teaches the feature of "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to greater than about 15 degrees." However, there is absolutely no disclosure in col. 1, lines 24-56 of Kushida et al. of any specific values for the half-width of a locking curve of an X-ray diffraction peak, and certainly no disclosure a half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to that is increased to a value greater than about 15 degrees as recited in the present claimed invention. In fact, Kushida et al. specifically discloses in col. 2, lines 3-11 and in the Abstract that "crystallites of the gold polycrystalline film are so oriented that the standard deviation of the locking curve for the (111) diffraction beam is smaller than 3°" (emphasis added).

Thus, not only does Kushida et al. fail to teach or suggest "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to greater than

Serial No. 10/026,811
March 15, 2004
Reply to the Office Action dated December 19, 2003
Page 6 of 7

about 15 degrees," but Kushida et al. also teaches away from the present claimed invention. Accordingly, Kushida et al. cannot be relied upon in an obviousness rejection of Applicants' claimed invention since it is error to find obviousness where references diverge and teach away from the invention at hand. W.L. Gore & Assoc. v. Garlock Inc., 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983).

Tsuji et al. is relied upon merely to teach a method step of sealing a package airtight, and certainly fails to teach or suggest "said base electrodes include a metallic material that increases the half-width of a locking curve of an X-ray diffraction peak from a (111) plane of Al in said intermediate electrodes to greater than about 15 degrees" as recited in Applicant's claim 16. Thus, Applicant respectfully submits that Tsuji et al. fails to cure the deficiencies of AAPA and Kushida et al. described above.

Accordingly, Applicant respectfully submits that AAPA, Kushida et al. and Tsuji et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of method steps and features recited in claim 16 of the present application.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 16 is allowable. Claims 17-19 depend upon claim 16, and are therefore allowable for at least the reasons that claim 16 is allowable.

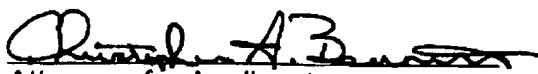
In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

Serial No. 10/026,811
March 15, 2004
Reply to the Office Action dated December 19, 2003
Page 7 of 7

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: March 15, 2004


Attorneys for Applicant

Joseph R. Keating
Registration No. 37,368

Christopher A. Bennett
Registration No. 46,710

KEATING & BENNETT LLP
10400 Eaton Place, Suite 312
Fairfax, VA 22030
Telephone: (703) 385-5200
Facsimile: (703) 385-5080